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EXAMINER

ZHANG, SHIRLEY X

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2144

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/767,593	Applicant(s) CHRON ET AL.	
	Examiner SHIRLEY X. ZHANG	Art Unit 2144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-13, 16-20, 22, 24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-13, 16-20, 22, 24 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This non-final office action is prepared in response to the applicant's request for continued examination (RCE) filed on June 11, 2008.

Claims 8, 9, 14, 15, 21, 23, 25 and 27 have been cancelled;

Claims 1-7, 10-13, 16-20, 22, 24 and 26 have been amended;

Claims 1-7, 10-13, 16-20, 22, 24 and 26 are now pending;

Response to Arguments

Applicant's arguments and amendments filed on have been carefully considered. They are not deemed fully persuasive.

Applicant's arguments are deemed moot in view of the following new grounds of rejection as explained here below, necessitated by Applicant's substantial amendment (i.e., *by incorporating new limitations into the independent claims, which will require further search and consideration*) to the claims which significantly affected the scope thereof.

It is the Examiner's position that Applicant has not yet submitted claims drawn to limitations, which define the operation and apparatus of Applicant's disclosed invention in a manner, which distinguishes over the prior art.

Failure for Applicant to significantly narrow definition/scope of the claims and supply arguments commensurate in scope with the claims implies the Applicant intends broad interpretation be given to the claims. The Examiner has interpreted the claims with scope parallel to the Applicant in the response and reiterates the need for the Applicant to more clearly and distinctly define the claimed invention.

Claim Objections

1. Claim 1 is objected to because it recites “NRS protocol” that appears to be a typographical error of “NFS protocol”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first and second paragraphs of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 1 and 12** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended claims 1 and 12 recite the following elements

- (a) “wherein said communication virtualizer combines multiple Ethernet packets received from a client computer into a jumbo packet,
- (b) wherein a data size of said multiple Ethernet packets received exceeds that of a maximum size supported by a Network File System (NFS) protocol, and
- (c) wherein a data size of said jumbo packet exceeds that of said maximum size supported by said NFS protocol.”

Although the specification disclosure in paragraph [0042] supports elements (a) and (c) above, the specification lacks support for element (b).

2. **Claims 1 and 12** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in the scope.

The amended claims 1 and 12 recite the following limitations

“wherein a data size of said multiple Ethernet packets received exceeds that of a maximum size supported by a Network File System (NFS) protocol,” and

It is unclear to the examiner whether the term “a data size” in the phrase “a data size of said multiple Ethernet packets” refers to the data size of one of the multiple Ethernet packets, or the data size of all said multiple Ethernet packets combined.

For the purpose of examination, examiner assumes the meaning of said data size to be “the data size of one of the multiple Ethernet packets.”

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-13, 16-22 and 24-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Miloushev et al. (U.S. PG-Pub no. 2002/0120763, hereinafter “**Miloushev**”), in view of

IETF RFC 1094 (“Network File System Protocol Specification”, version 2.0, hereinafter “**RFC 1094**”), and Parrella, et al. (US PG-Pub No. 2003/0051055, hereinafter “Parrella”).

As to claim 1, Miloushev disclosed a communications network comprising:

a communication virtualizer (Fig. 1 and [0053-0054] disclose a file switch as an intermediate node that switches network protocol traffic),

a plurality of network-attached store computers connected to said communication virtualizer (Fig. 1 shows multiple file servers 101-107 that is connected to the file switch 100),

wherein said plurality of network-attached store computers are configured to appear as a single available network-attached store computer (Fig. 1 and [0061] disclose that the file switch aggregates the namespaces of multiple independent file servers and presents them as a single, unambiguous namespace to network clients); and

said client computer being connected to said communication virtualizer (Fig. 1 and [0125] disclose that clients request file services by communicating to the file switch 100 using the NFS or CIFS protocols),

wherein said client computer sends requests for storage to said communication virtualizer (Fig. 1 and [0125] disclose that clients request file services by communicating to the file switch 100 using the NFS or CIFS protocols),

wherein said requests for storage are transmitted as a series of standard Ethernet packets, each packet comprising a portion of the request for storage, and said data size for said series of standard Ethernet packets exceeds that of said maximum size supported by said NFS protocol

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(Miloushev, Fig. 4 and [0141-0142] disclosed that the request for storage 205 are transmitted as a series of packets 201-204)

wherein said packets comprising a similar request for storage are linked together using a request identifier (RFC 1094, section 2.2 “Server Procedure” disclosed as an inherent feature of NFS protocol that the NFS server creates a file handle and sends it to the client when the client first opens the file. The client sends the handle back to the server when it requests operations on the file. In other words, the file handle is used as a request identifier) and a said packet sequence number (the IP header of a packet inherently contains a sequence number field that identifies a packet), and

and wherein each request for storage comprises a unique request identifier that is shared among said packets comprising said similar request (as addressed above that a file handle carried by each NFS request is a request identifier).

Milousheve further disclosed

wherein a data size of said multiple Ethernet packets received exceeds that of a maximum size supported by a Network File System (NFS) protocol (This claim limitation is always true when a maximum size supported by a NFS protocol is smaller than Ethernet’s maximum frame size, because it is well known in the art of TCP/IP that the size of an Ethernet packet equals the size of an NFS data payload plus the size of TCP header, IP header and Ethernet header combined),

wherein a data size of said jumbo packet exceeds that of said maximum size supported by said NFS protocol (This claim limitation is always true when a maximum size supported by a

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NFS protocol is smaller than Ethernet's maximum frame size for the same reason as that given above).

Miloushev did not explicitly disclose wherein said communication virtualizer combines multiple Ethernet packets received from a client computer into a jumbo packet.

However, Parrella et al. disclosed a method for combining many small TCP/IP packets into one large IP packets (Parrella, [0060-0066]).

One of ordinary skill in the art would have been motivated to combine Miloushev and Parrella because both disclosed transmitting application data units between clients and servers via an intermediate node (Miloushev [0125], “file switch” and Parrella [0062], “Super User”).

Therefore, it would have been obvious for one skilled in the art to incorporate Parrella’s teaching into Miloushev’s file switch to have the file switch combine a plurality of NFS Ethernet packets into one jumbo Ethernet packet, so as to achieve the desirable result of optimally utilizing the available network bandwidth by reducing the overhead that would have been introduced otherwise by the control data in each small Ethernet packet.

As to claim 2, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises an internal network of connection nodes connecting said communication virtualizer with said network-attached store computers (Fig. 1 and [0124] discloses that the file switch connects to a file server network through connections 110, 114 and other similar connections).

As to claim 3, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises a plurality of

external network connections for facilitating a transfer of requests sent by said client computer to said communication virtualizer (Fig. 1 and [0124] disclose that the file switch connects to the client network 111 through connection 109).

As to claim 4, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises a plurality of external connection paths for facilitating direct communication between said network-attached store computers and said client computer (Fig. 1 and [0125] disclose that the presence of file switch 100 is thereby preferably transparent to both the clients and the servers, therefore it facilitates direct communication between the network file servers and the clients).

As to claim 5, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises an Ethernet networking hardware and medium access protocols for facilitating communication within said communication network ([0122] discloses that the file switch is preferably equipped with multiple high-speed network interfaces, such as gigabit or higher Ethernet interfaces).

As to claim 6, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises a Transmission Control Protocol / Internet Protocol suite for facilitating communication between said network-attached store computers and said client computer [0133] discloses that the file switch contains a TCP protocol stack).

As to claim 7, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises a storage access protocol for facilitating communication between a storage component within said communications network and remaining components within said communications network ([0123] discloses that the file switch preferably supports multiple industry standard network file protocols, such as NFS and CIFS).

Claims 8-9 (cancelled)

As to claim 10, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed wherein said communication virtualizer comprises a network router ([0133] discloses that the typical operation of the file switch involves receiving file protocol requests, such as login, tree connect/mount, file open, file read/write, etc., from clients 112 and 113 and forwarding, or switching these requests to one or more of the file servers 101 through 107, therefore the file switch has the function of a network router).

As to claim 11, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Milousheve further disclosed that the network comprises a communication virtualizer file switch connected to a client computer and a server computer for sending requests from said client computer to said network-attached store and from said network-attached store back to said client computer (Fig. 5 and [0133] disclose that the file switch forwards client

requests to the file servers; [0134] discloses that the file switch sends responses from the server back to the client).

As to claim 12, Miloushev disclosed a method of communication over a communications network, said method comprising:

sending requests for storage originated by at least one client computer over said communications network ([0141] disclosed that a client connected to the file switch initiates a write transaction by issuing a request message);

wherein said requests comprise multiple standard Ethernet packets (Figs. 2 and 4 disclosed that a write request 205 comprises multiple Ethernet packets 201-204), and

wherein each of said requests has a data size exceeding that of a maximum size supported by a Network File Switch (NFS) protocol (This claim limitation is always true when a maximum size supported by a NFS protocol is smaller than Ethernet's maximum frame size, because it is well known in the art of TCP/IP that the size of an Ethernet packet equals the size of an NFS data payload plus the size of TCP header, IP header and Ethernet header combined);

receiving said requests for storage in at least one communication virtualizer ([0141] disclosed that a request message issued by a client is addressed to the file switch, therefore the file switch receives said request message; Here the file switch is a communication virtualizer),

wherein a data size of said multiple standard Ethernet packets received exceeds that of a maximum size supported by a Network File System (NFS) protocol(This claim limitation is always true when a maximum size supported by a NFS protocol is smaller than Ethernet's

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maximum frame size, because it is well known in the art of TCP/IP that the size of an Ethernet packet equals the size of an NFS data payload plus the size of TCP header, IP header and Ethernet header combined),

wherein a data size of said jumbo packet exceeds that of said maximum size supported by said NFS protocol (This claim limitation is always true when a maximum size supported by a NFS protocol is smaller than Ethernet's maximum frame size for the same reason as that given above); and

transmitting the received requests for storage to a plurality of network-attached store computers connected to said communication virtualizer ([0133] discloses that the typical operation of the file switch involves receiving file protocol requests, such as login, tree connect/mount, file open, file read/write, etc., from clients 112 and 113 and forwarding, or switching these requests to one or more of the file servers 101 through 107)

wherein said plurality of network-attached store computers are configured to appear as a single network-attached store computer (Fig. 1 and [0061] disclose that the file switch aggregates the namespaces of multiple independent file servers and presents them as a single, unambiguous namespace to network clients).

wherein said requests for storage are transmitted as a series of packets, each packet comprising a portion of the request for storage ([0054] discloses that one aspect of the present invention is a network node that switches network protocol traffic by receiving the first network frame of a multiframe file protocol request, examining the file protocol header of that request, determining how or where the remaining frames of the request are to be forwarded and then forwarding each of those frames as it is received based on this determination)

wherein each packet comprises a packet sequence number (the IP header of a packet inherently contains a sequence number field that identifies a packet; see RFC 791 for more information),

wherein said packets comprising a similar request for storage are linked together using a request identifier (RFC 1094, section 2.2 “Server Procedure” disclosed as an inherent feature of NFS protocol that the NFS server creates a file handle and sends it to the client when the client first opens the file. The client sends the handle back to the server when it requests operations on the file. In other words, the file handle is used as a request identifier) and a packet sequence number (the IP header of a packet inherently contains a sequence number field that identifies a packet), and

wherein each request for storage comprises a unique request identifier that is shared among said packets comprising said similar request (as has been addressed above, a file handle carried by each NFS request is a request identifier); and

transmitting, by said store computers, response packets to said communication virtualizer, wherein each of said response packets identifies said client computer ([0134] disclosed that the server forms a response and send it to the client, via the file switch, which implies that the response must identify the client).

Miloushev did not explicitly disclose

wherein said communication virtualizer combines multiple Ethernet packets received from a client computer into a jumbo packet.

However, Parrella et al. disclosed a method for combining many small TCP/IP packets into one large IP packets (Parrella, [0060-0066]).

One of ordinary skill in the art would have been motivated to combine Miloushev and Parrella because both disclosed transmitting application data units between clients and servers via an intermediate node (Miloushev [0125], “file switch” and Parrella [0062], “Super User”).

Therefore, it would have been obvious for one skilled in the art to incorporate Parrella’s teaching into Miloushev’s file switch to have the file switch combine a plurality of NFS Ethernet packets into one jumbo Ethernet packet, so as to achieve the desirable result of optimally utilizing the available network bandwidth by reducing the overhead that would have been introduced otherwise by the control data in each small Ethernet packet.

As to claim 13, the combination of Miloushev and Parrella disclosed the communications network of claim 12. Miloushev further disclosed wherein said communication virtualizer, upon receiving requests from said client computer, transmits said requests for storage to a chosen network-attached store computer based on a capability of said chosen network-attached store computer to properly process said request for storage ([0128] discloses that file switch can be divided into three broad categories: transaction handling which includes transaction switching and transaction aggregation, file system aggregation which includes aggregating file system objects and file data, and switch aggregation which includes various mechanisms for combining multiple file switches together).

Claims 14-15 (cancelled)

As to claim 16, the combination of Miloushev and Parrella disclosed the communications network of claim 12. Miloushev further disclosed wherein said network-attached store computer is configured for:

receiving said requests for storage from said communication virtualizer ([0134] discloses that the TCP protocol stack on the server receives frames 201 through 204 as they arrive);

processing said request for storage ([0134] discloses that the server waits until it has received the whole message 205 and then interprets the contents of the header 200, and executes the required operation, in this case a file write, by writing the data payload to the proper file);

creating a corresponding response to said request for storage and sending said corresponding response to said communication virtualizer ([0134] discloses that upon completion, the server forms a response header 207 indicating the results of the requested operation).

packetizing said corresponding response (it is inherent in IP network to packetize data);

sending said corresponding response to said communication virtualizer ([0134] discloses that the TCP protocol stack forms a network frame 206 containing the header 207 and sends it to the client).

As to claim 17, the combination of Miloushev and Parrella disclosed the communications network of claim 16. Miloushev further disclosed wherein said communication virtualizer is configured for receiving said corresponding response from said network-attached store computer; determining a chosen client computer to which said corresponding response should be routed to; and routing said corresponding response to a chosen client computer ([0144-0145]

discloses that the file switch receives responses from the file server, processes them and then sends them to the client).

As to claim 18, Miloushev the combination of Miloushev and Parrella disclosed the communications network of claim 17. Miloushev further disclosed wherein said chosen client computer is configured for receiving said corresponding response from said communication virtualizer ([0144] discloses that the switch then examines the transaction reply header 400 and determines how to modify that header so that the client on connection 109 would accept the modified result as a valid response to the original request 205, which implies that the client is configured for receiving responses from the file switch);

de-packetizing said corresponding response (it is inherent in TCP/IP network); and
routing said corresponding response to an initiating application ([0123] discloses that the file switch preferably supports multiple industry standard network file protocols, such as NFS and CIFS, which implies that there must be a NFS or CIFS application on the client to receive and process responses to the requests).

As to claim 19, the combination of Miloushev and Parrella disclosed the communications network of claim 15. Miloushev further disclosed wherein said packets are categorized from a zeroth (0th) packet to an ith packet ([0123] discloses that the file switch preferably supports multiple industry standard network file protocols, such as NFS and CIFS, which inherent implies that the requests are sent using IP; RFC 791 discloses the fragmentation technique used by

Internet Protocol (IP) for data payload that's bigger than what the physical layer medium can support)

As to claim 20, the combination of Miloushev and Parrella disclosed the communications network of claim 19. Miloushev further disclosed wherein said communication virtualizer determines which network-attached store computer to transmit said request for storage to by examining said zeroth packet in said request ([0137] discloses that upon receipt of the first frame 201, which contains the request header 200, the switch 100 recognizes that this frame signifies the beginning of a new message, examines the header 200 and decides to which of the file servers to forward the whole message).

Claim 21 (cancelled)

As to claim 22, the combination of Miloushev and Parrella disclosed the communications network of claim 21. Miloushev further disclosed that said network-attached store computer sends a standard Ethernet packet to said communication virtualizer in reply to a client computer's request (0122] discloses that the file switch is preferably equipped with multiple high-speed network interfaces, such as gigabit or higher Ethernet interfaces);

Miloushev does not explicitly disclose but it is inherent in RFC 791 that said communication virtualizer dividing said standard Ethernet packet into a plurality of standard Ethernet packets to send to said client computer as a response comprising multiple standard Ethernet packets (RFC 791, Section 2.3 "Function Description" discloses that IP employs the

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fragmentation technique that segments large packets into a series of smaller packets of a size that the underlying physical medium supports, as each type of physical media has its own Maximum Transmission Unit (MTU) requirement; In other words, if the communication virtualizer receives from the network attached storage computer as a response a single packet of large size, e.g., a jumbo Gigabit Ethernet packet of 9000 bytes, the IP protocol built into the communication virtualizer will divide said large packet into a plurality of standard 1500-byte Ethernet packets that is acceptable to the regular 100Mbps Ethernet connecting the said virtualizer to client computers).

Claim 23 (Cancelled)

As to claim 24, the combination of Miloushev and Parrella disclosed the communications network of claim 1. Miloushev further disclosed wherein said communication virtualizer is adapted to translate a first protocol of said requests for storage to a second protocol different from said first protocol ([0068] discloses an aspect of the invention which essentially is to translate a first protocol of requests from the client into a second protocol and forwards the translated request to the file server).

Claim 25 (cancelled)

As to claim 26, the combination of Miloushev and Parrella disclosed the communications network of claim 12. Miloushev further disclosed wherein said communication virtualizer is

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adapted to translate a first protocol of said requests for storage to a second protocol different from said first protocol ([0068] discloses one aspect of the invention which essentially is to translate a first protocol of requests from the client into a second protocol and forwards the translated request to the file server).

Claim 27 (cancelled)***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHIRLEY X. ZHANG whose telephone number is (571)270-5012. The examiner can normally be reached on Monday through Friday 7:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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